INDEX

A

Acetylcholine, (Ach) effect on the central nervous system of *Carcinus maenas*, 402
metabolism in *Arbacia*, 374
Acid phosphatase in tridacnid clams, 222
ACKERMAN, N. R. AND C. B. METZ. Effects of multiple antibody layers on the morphology and fertilizability of sea urchin eggs, 376
Activity patterns in barnacle isolated central nervous system, relation to behavior of, 502
Adaptation, light and dark, in the eye of the living squid, 398
respiratory, to oxygen minimum layer by *Gnathophausia ingens*, 109
Adaptational changes in ganglion cells in *Mustelus* retina, 403
Adductor muscles, relationship to hinge ligaments in bivalve mollusks, 392
Age and growth of *Loligo pealei*, 189
Aggregation, sponge, involvement of carbohydrates in, 380
in cellular slime molds, 146
Algae, salt marsh, enumeration and selective isolation of, 394
symbiotic, in coral calcification, role of, 350
ALLEN, G. E. Mechanistic biology and physics, 1900–1930, 376
Amino acid incorporation, *in vitro* assay of, 398
transport in toadfish liver, 389
Amino acids, dissolved free, release by *Dugesia dorotocephala* and *Bdelloura candida* of, 364
free, uptake and release by starfish, 122
Amoebocytes, host, in giant clams, intracellular digestion of symbiontic zooxanthellae by, 222
Analysis, autoradiographic, of species specificity during sponge cell reaggregation, 319
ANDERSON, R. S. Cellular responses to foreign bodies in the tunicate *Molgula manhattensis* (DeKay), 91
Annual Report of the Marine Biological Laboratory, 1
Anode-break excitation, 387
Antibody layers, multiple, effects on fertilizability of sea urchin eggs, 376
APLEY, M. L. See W. D. RUSSELL-HUNTER, 400
Arbacia eggs, electron diffraction study of jelly coat of, 391
Arbacia punctulata, effect of hyperbaric oxygen on the embryonic development of, 390
fertilization of, 387
eggs, redistribution of beta-glucuronidase after fertilization of, 407
oocytes, *in vitro* maturation of 383
oocytes, *in vivo* radioactive labeling of DNA in, 397
Arbacia spermatozoa, UV-irradiated, post-fertilization dark recovery of, 400
motility control mechanisms in, 374
Arginine, in invertebrates, 167
Artemia salina, muscle development and function in, 386
Ascidian eggs, differentiation without cleavage in, 407
Ascidians, defense mechanisms of, 91
Asterias forbesii, analysis of DNA synthesis during oocyte maturation and early cleavage in, 405
changes in ionic permeability during early development of, 404
RNA synthesis during oocyte maturation in, 394
Asteroidea, uptake and release of free amino acids by, 122
ATP level in cellular slime molds, effect of light and temperature on, 146
Aurelia, cellular differentiation in the planula of, 378
Autoradiographic analysis of species specificity during sponge cell reaggregation, 319
AVISE, J. C. See R. K. SELANDER, 402
Axon fluorescence, changes in, 382
Axons, repetitive-firing, membrane current in, 383
Axoplasm of the squid giant axon, mechanical properties of, 378

B

Bacteria, bioluminescent, from the light organ of pony fish, 261
salt marsh, enumeration and selective isolation of, 394
as symbionts from the light organ of pony fish, 261

INDEX

A

Acetylcholine, (Ach) effect on the central nervous system of *Carcinus maenas*, 402
metabolism in *Arbacia*, 374
Acid phosphatase in tridacnid clams, 222
ACKERMAN, N. R. AND C. B. METZ. Effects of multiple antibody layers on the morphology and fertilizability of sea urchin eggs, 376
Activity patterns in barnacle isolated central nervous system, relation to behavior of, 502
Adaptation, light and dark, in the eye of the living squid, 398
respiratory, to oxygen minimum layer by *Gnathophausia ingens*, 109
Adaptational changes in ganglion cells in *Mustelus* retina, 403
Adductor muscles, relationship to hinge ligaments in bivalve mollusks, 392
Age and growth of *Loligo pealei*, 189
Aggregation, sponge, involvement of carbohydrates in, 380
in cellular slime molds, 146
Algae, salt marsh, enumeration and selective isolation of, 394
symbiotic, in coral calcification, role of, 350
ALLEN, G. E. Mechanistic biology and physics, 1900–1930, 376
Amino acid incorporation, *in vitro* assay of, 398
transport in toadfish liver, 389
Amino acids, dissolved free, release by *Dugesia dorotocephala* and *Bdelloura candida* of, 364
free, uptake and release by starfish, 122
Amoebocytes, host, in giant clams, intracellular digestion of symbiontic zooxanthellae by, 222
Analysis, autoradiographic, of species specificity during sponge cell reaggregation, 319
ANDERSON, R. S. Cellular responses to foreign bodies in the tunicate *Molgula manhattensis* (DeKay), 91
Annual Report of the Marine Biological Laboratory, 1
Anode-break excitation, 387
Antibody layers, multiple, effects on fertilizability of sea urchin eggs, 376
APLEY, M. L. See W. D. RUSSELL-HUNTER, 400
Arbacia eggs, electron diffraction study of jelly coat of, 391
Arbacia punctulata, effect of hyperbaric oxygen on the embryonic development of, 390
fertilization of, 387
eggs, redistribution of beta-glucuronidase after fertilization of, 407
oocytes, *in vitro* maturation of 383
oocytes, *in vivo* radioactive labeling of DNA in, 397
Arbacia spermatozoa, UV-irradiated, post-fertilization dark recovery of, 400
motility control mechanisms in, 374
Arginine, in invertebrates, 167
Artemia salina, muscle development and function in, 386
Ascidian eggs, differentiation without cleavage in, 407
Ascidians, defense mechanisms of, 91
Asterias forbesii, analysis of DNA synthesis during oocyte maturation and early cleavage in, 405
changes in ionic permeability during early development of, 404
RNA synthesis during oocyte maturation in, 394
Asteroidea, uptake and release of free amino acids by, 122
ATP level in cellular slime molds, effect of light and temperature on, 146
Aurelia, cellular differentiation in the planula of, 378
Autoradiographic analysis of species specificity during sponge cell reaggregation, 319
AVISE, J. C. See R. K. SELANDER, 402
Axon fluorescence, changes in, 382
Axons, repetitive-firing, membrane current in, 383
Axoplasm of the squid giant axon, mechanical properties of, 378

B

Bacteria, bioluminescent, from the light organ of pony fish, 261
salt marsh, enumeration and selective isolation of, 394
as symbionts from the light organ of pony fish, 261

BANNER, J. L., III. See W. D. RUSSELL-HUNTER, 400
Barnacles, activity patterns in the isolated central nervous system of, 502
behavior of, 502
Bdelloura candida, effects of salinity and starvation on release of dissolved free amino acids by, 364
BEAUCHAMP, R. S., S. A. HILDEN, D. L. KROPP AND P. B. DUNHAM. Sodium and potassium influxes in *Tetrahymena*, 377
Behavior, relationship of activity patterns in the barnacle isolated central nervous system to, 502
specializations for feeding in reef corals, 247
specificity in a symbiotic polychaete, 472
BENNETT, M. V. L. AND M. E. SPIRA. Properties of junctions mediating electrical coupling between embryonic cells, 378
BENNETT, M. V. L. See A. B. STEINBACH, 403
BERGSTROM, B. H. AND G. W. HINSCH. Cellular differentiation in the planula of *Aurelia*, 378
Beta-glucuronidase, redistribution of, after fertilization of *Arbacia* eggs, 407
Biochemical phylogeny of invertebrates, 167
Biogeography of Gastrotricha, 390
Biological rhythm in the spotted newt, 319
Biology, mechanistic, 1900–1930, 376
Bioluminescence of bacteria in the light organ of pony fish, 261
of scintillons, 401
BIRKELAND, C., F-S. CHIA AND R. R. STRATHMANN. Development, substratum selection, delay of metamorphosis and growth in the seastar, *Mediaster aequalis* Stimpson, 99
BITO, L. Z., D. TURANSKY AND A. VAN VORIS. Concentrative accumulation of prostaglandins by some tissues of marine invertebrates and vertebrates, 372
Blood, insect, in tissue development, 527, 541
Bluefish, effect of temperature on activity of, 337
BOGITSH, B. J. See P. L. KRUPA, 393
BORG, S. F. Mechanical properties of the sheath and axoplasm of the squid giant axon, 378
BORGESE, T. A. AND R. EGNOR. Iso-electric gel focusing of maturing duck hemoglobins, 372
BOWEN, R. A., J. M. ST. ONGE, C. A. PRICE AND J. B. COLTON, JR. Density gradient centrifugation as an aid in sorting planktonic organisms, 379
BRADBURY, J. C. See G. F. GWILLIAM, 502
Brain hormone, insect, 541
Brain implants in *Crepidula fornicata*, 400
BROWN, J. E. AND M. I. MOTE. Na^+-dependence of reversal potential of light-induced current in *Limulus* ventral photoreceptors, 379
BROWN, J. E. See J. E. LISMAN, 395
Bufo arenarum eggs, respiratory regulation in, 154
BURGER, M. M., S. M. LEMON AND R. RADIUS. Sponge aggregation I: Are carbohydrates involved?, 380
BURGER, M. M. See W. J, KUHNS, 393 AND G. WEINBAUM, 406
Burrowing in marine animals using Cryolite, 392
Burst discharge rate of lobster cardiac ganglion, modulation of, 396.

C

Ca^{++}-EGTA, injection of into *Limulus* photoreceptors, 395
CAGAN, L. P. See A. GROSSMAN, 387 AND G. WEISSMANN, 407
Calcification of coral, role of symbiotic algae in, 350
Calcium, presynaptic action of, 403
Callinectes sapidus, membrane current in repetitive-firing axons of, 383
Campanularia flexuosa, fertilization and capacitation-like interaction, *in vitro*, in, 398
Cape Cod Bay, ecology, systematics and description of Tubificidae of, 203
Carbohydrates, involvement in sponge aggregation of, 380
CARBONE, E. See M. HALLETT, 388
Carcinus maenas, effect of acetylcholine on the central nervous system of, 402
Cardiac muscle of *Limulus*, 269
Carrageenan, incorporation of sulfate into, 405
CARRIKER, M. R. Preliminary study by scanning electron microscopy of dissolution of the shell of *Mytilus* by the accessory boring organ of *Urosalpinx*, 380
CASTRO, A. E. See C. B. METZ, 373
Cecropia moth, hybridization analysis of DNA replication in, 384
Cells, embryonic, properties of junctions mediating electrical coupling of, 378
ganglion, spatial organization and adaptational changes in, 403
light producing, in *Mnemiopsis*, localization of, 399
light producing, in *Mnemiopsis*, role of embryogenesis in formation of, 386

Cellular responses to foreign bodies in *Molgula manhattensis*, 91
Central nervous system of a crab, effect of acetylcholine on, 402
Centrally generated rhythms in barnacles, 502
Centrifugation, density gradient, as an aid in sorting planktonic organisms, 379
Cephalopoda, age and growth of, 189
temperature effects on the embryo development rate of, 561
CERVETTO, L. AND E. F. MACNICHOL, JR. Pharmacology of horizontal cells in the isolated perfused skate retina, 381
Chaetopterus development, effect of puromycin on, 388
Chemotaxis in a symbiotic polychaete, 472
CHIA, F-S. See C. BIRKELAND, 99
CHILDRESS, J. J. Respiratory adaptations to oxygen minimum layer in the bathypelagic mysid *Gnathophausia ingens*, 109
Chondrus, incorporation of sulfate into carrageenan in, 405
Ciona intestinalis, development of muscle acetylcholinesterase in eggs of, 407
Circadian water-drive response to prolactin in the spotted newt, 331
Circular dichroism of d-tubocurarine, 399
Cirripede neurophysiology, 502
Clam, surf, eggs, changes in tubulin organization during meiosis in, 406
Clams, intracellular digestion of symbiontic zooxanthellae by host amoebocytes in, 222
CLAYTON, R. K. AND R. HASELKORN. Analysis of photosynthetic membranes by acrylamide gel electrophoresis, 381
Cleavage, early, in *Asterias forbesii*, analysis of DNA synthesis during, 405
Cline, distribution of a marine ectoproct along a, 235
Cliona celata, aggregation in, 380
CLONEY, R. A., J. LASH AND R. R. MINOR. Ascidian metamorphosis: Contractile tissues, cytochalasin B and hydrostatic pressure, 382
Coelacanth, osmotic constituents of, 553
COHEN, A. I. Inter-receptor relations in the retinas and optic lobes of the squid, *Loligo pealii:* an electron microscopic investigation, 382
COHEN, L. B., H. V. DAVILA AND A. S. WAGGONER. Changes in axon fluorescence, 382
Colchicine, effects on regeneration in *Tubularia*, 395
Collagen fibrillogenesis in *Fundulus*, effect of copper on, 389
COLTON, J. B., JR. See R. A. BOWEN, 379
COLWIN, A. L. See R. G. SUMMERS, 404
COLWIN, L. H. See R. G. SUMMERS, 404
Commensalism in a symbiotic polychaete, 472
Conditioning in a symbiotic polychaete, 472
Conformational changes in microtubules, 592
CONNOR, J. A. A transient outward membrane current in repetitive-firing axons, 383
Contraction pulses in *Hydra*, 299
CONWAY, C. M. AND C. B. METZ. *In vitro* maturation of *Arbacia punctulata* oocytes, 383
COOK, D. G. The Tubificidae (Annelida, Oligochaeta) of Cape Cod Bay. II. Ecology and systematics, with the description of *Phallodrilus parviatriatus* nov. sp., 203
COOK, S. B. A study of homing behavior in the limpet *Siphonaria alternata*, 449
Copper, effect on collagen fibrillogenesis in *Fundulus heteroclitus*, 389
Coral calcification, role of symbiotic algae in, 350
Coral reef, a dynamic ecosystem, 247
Corals, reef, autotrophs or heterotrophs?, 247
CORNELL, J. C. See S. K. ITAYA, 391
COUSINEAU, G. H. See P. GUERRIER, 388, S. INOUE, 391, P. L. KRUPA, 393 AND C. G. PILAPIL, 398
COWARD, S. J. See K. L. WEBB, 364
Coxal feeding movements in *Limulus*, neuromuscular basis of, 408
Crab, spider, DNA analysis in, 405
microsporidia in reproductive tract of, 375
Crab vas deferens, spermatophore formation in, 373
Crabs, fiddler, biochemical population genetics of, 402
Crayfish, escape reflex circuit in, 408
Creatine, in invertebrates, 167
Crepidula convexa, population dynamics and life history of, 514
Crepidula fornicata, brain implants and sex change in, 400
CRIPPA, M. AND W. TELFER. Hybridization analysis of DNA replication in nurse and follicle cells in Cecropia moth, 384
Crossaster papposus, development of, 99
Crustacea, discussion of larval characters in, 485
Cryolite, new technique for observing burrowing in marine animals, 392
Ctenodiscus, fine structure of acrosomal region in spermatozoa of, 404
Current, light-induced in *Limulus*, sodium dependence of reversal potential of, 379
membrane, in repetitive-firing axons, 383
Cytochalasin B in Ascidian metamorphosis, 382

Cytochrome oxidase activity in trematode larvae, ultrastructural demonstration of, 393

D

DAVENPORT, D. See R. V. DIMOCK, JR., 472
DAVILA, H. V. See L. B. COHEN, 382
DAW, N. W. See A. L. PEARLMAN, 398
DE VLAMING, V. L. The effects of food deprivation and salinity changes on reproductive function in the estuarine gobiid fish, *Gillichthys mirabilis*, 458
Demosponges, marine, particle feeding in natural populations of, 568
Description of *Phallodrilus parviatriatus*, 203
DETWILER, P. B. See W. K. STELL, 403
Development, and function of swimbladder in haddock, 176
of *Chaetopterus*, effect of puromycin on, 388
of insect tissues *in vitro*, 527, 541
of *Mediaster aequalis*, 99
of muscle in *Artemia salina*, 386
rate of squid embryos, effects of temperature on, 561
Diapause, insect, 527
Differentiation, cellular, in the planula of *Aurelia*, 378
Digestion, intracellular, of symbiontic zooxanthellae by host amoebocytes in giant clams, 222
DIMOCK, R. V., JR. AND D. DAVENPORT. Behavioral specificity and the induction of host recognition in a symbiotic polychaete, 472
Director's Report, 7
DNA, in *Arbacia* oocytes, radioactive labeling of, 397
analysis in *Libinia emarginata*, 405
replication in Cecropia moth, hybridization of, 384
synthesis in *Asterias forbesii*, analysis of, 405
Dogfish lens, inhibition of protein synthesis in, 409
Dogfish retina protein synthesis, inhibition of by near UV light, 391
DOWLING, J. E. AND H. RIPPS. Aspartate isolation of receptor potentials in the skate retina, 384
D-tubocurarine, circular dichroism of, 399
Duck hemoglobins, iso-electric gel-focusing of, 372
Dugesia dorotocephala, effects of salinity and starvation on release of dissolved free amino acids by, 364
DUNHAM, P. B. See R. S. BEAUCHAMP, 377
DWYER, N. K. See G. A. WYSE, 408

E

Ecdysone, role of in spermatogenesis of silkworms, 527, 541
Echinodermata, distribution of phosphagens in, 167
uptake and release of free amino acids by, 122
Echinoids, respiratory adaptations of the podia of, 385
Ecology and systematics of *Phallodrilus parviatriatus*, 203
Ecosystem, dynamic, of reef corals, 247
Ecteinascidia turbinata heart, 130
Ectoproct, marine, genetic variation in, 235
Effects of freezing on *Latimeria*, 553
of temperature on the activity of bluefish, 337
of injury in silkworms, 527, 541
EGNOR, R. See T. A. BORGESE, 372
ELDER, H. Y. High frequency muscles used in sound production by a katydid. II. Ultrastructure of the singing muscles, 434
Electrical coupling between embryonic cells, mediation of, 378
Electron diffraction study of jelly coat of *Arbacia* eggs, 391
Electron microscopy of the flight muscles of the tetigoniid *Neoconocephalus*, 434
of the structural organization of the free cell border in reef corals, 247
scanning of dissolution of the shell of *Mytilus* by boring organ of *Urosalpinx*, 380
Electrophoresis, gel, analysis of photosynthetic membranes, 381
of a marine ectoproct, 235
Electrophoretic observation of iso-electric gel focusing of duck hemoglobins, 372
Embryogenesis, *Mnemiopsis*, role in the formation of light producing cells of, 386
Embryonic development of *Arbacia punctulata*, effect of hyperbaric oxygen on, 390
Embryos, squid, temperature effects on the development rate of, 561
Encapsulation in tunicates, 91
Endosymbiosis of bioluminescent bacteria from the light organ of pony fish, 261
Enigmatic phylogeny, return of *Trichoplax adhaerens*, 374
Enumeration of salt marsh algae, bacteria, protozoa and micrometazoan herbivores, 394
Epidermis, hypertrophied siphonal, in clams, nutritional role of, 222
Escape reflex circuit in crayfish, 408
Excitation process in nerve with extrinsic fluorescence, 388

F

FAILLA, P. M. See R. C. RUSTAD, 400
FANKBONER, P. V. Intracellular digestion of symbiontic zooxanthellae by host amoebocytes in giant clams (Bivalvia: Tridacnidae), with a note on the nutritional role of the hypertrophied siphonal epidermis, 222
FARMANFARMAIAN, A., A. ROSS AND D. MAZAL. Coupled transport of sodium and sugar—*in vivo* evaluation in the intestine of the toadfish, *Opsanus tau*, 385
Feeding, particle, in demosponges, 568
Feeding in reef corals, 247
FENNER, D. H. A comparative study of the respiratory adaptations of the podia of Echinoids, 385
FERGUSON, J. C. Uptake and release of free amino acids by starfishes, 122
FERNANDEZ, S. N. See A. H. LEGNAME, 154
Fertility control, possible, using mammalian sperm hyaluronidase, 373
Fertilizability of sea urchin eggs, effects of multiple antibody layers on, 376
Fertilization, *in vitro*, in *Campanularia flexuosa*, 398
of *Arbacia* eggs, redistribution of beta-glucuronidase after, 407
of *Arbacia* eggs, relationship to redistribution of tosylerginine methyl ester hydrolase activity of, 387
Fibrillogenesis, collagen, in *Fundulus*, effect of copper on, 389
Filter-feeding in marine demosponges, 568
FINCK, H, Some aspects of muscle development and function in *Artemia salina*, 386
Fine structure of acrosomal region in spermatozoa of *Ctenodiscus* and *Thyone*, 404
Fish, endosymbiotic bioluminescent bacteria from the light organ of, 261
estuarine gobiid, effects of food deprivation and salinity changes on reproductive function in, 458
FISHER, F. M., JR. See G. A. KAHLER, JR., 392
Flatworm, microtubules of spermatozoan in, 592
FLESSA, K. W. See R. K. JOSEPHSON, 392
Fluorescence, extrinsic, in nerve, excitation process in, 388
in axons, changes in, 382
Food deprivation and salinity changes, effects on reproductive function in an estuarine gobiid fish, 458
FRANZ, D. R. See G. HENDLER, 514
FREEMAN, G., G. T. REYNOLDS AND J. R. MILCH. A cytoplasmic interaction during the first stages of embryogenesis that plays a necessary role in the formation of light producing cells in the ctenophore *Mnemiopsis*, 386
FREEMAN, G. See G. T. REYNOLDS, 399
Function and development of swimbladder in haddock, 176
Function of muscle in *Artemia salina*, 386
Fundulus, properties of junctions mediating electrical coupling between embryonic cells of, 378
Fundulus heteroclitus, effect of copper on collagen fibrillogenesis in, 389

G

Ganglion, cardiac, of *Limulus*, 269
GARCIA, L. E. See A. H. MEIER, 331
Gas gland glycogen in haddock, 176
Gastropod homing behavior, 449
Gastrotricha, biogeography of, 390
Gel focusing, iso-electric, of maturing duck hemoglobins, 372
GELPERIN, A. See A. R. MACKAY, 396
Genetic homozygosity, relationship to environmental stability in deep sea invertebrates, 401
Genetic polymorphism in the marine ectoproct, 235
Genetic variation in *Schizoporella errata*, 235
Gillichthys mirabilis, effects of food deprivation and salinity changes on reproductive function in, 458
Glutamate, postsynaptic action of, 403
Gnathophausia ingens, respiratory adaptation to oxygen minimum layer by, 109
GOLDFINGER, M. D. Anode-break excitation: a formalistic calculation, 387
Gonyaulax polyedra, bioluminescence of, 401
GOOCH, J. L. AND T. J. M. SCHOPF. Genetic variation in the marine ectoproct *Schizoporella errata*, 235
See T. J. M. SCHOPF, 401
GORE, R. H. *Petrolisthes tridentatus:* The development of larvae from a Pacific specimen in laboratory culture with a discussion of larval characters in the genus (Crustacea: Decapoda: Porcellanidae), 485
GOREAU, N. I. See T. F. GOREAU, 247
GOREAU, T. F., N. I. GOREAU AND C. M. YONGE. Reef corals: Autotrophs or heterotrophs?, 247
GROSSMAN, A., L. CAGAN, M. LEVY, W. TROLL, S. WECK AND G. WEISSMANN. Is the redistribution of tosylerginine methyl ester hydrolase activity that follows fertilization of *Arbacia punctulata* eggs intimately related to embryogenesis?, 387

GROSSMAN, A. See G. WEISSMANN, 407
Growth, pseudocolonial, in hydra, 278
Growth and age of *Loligo pealei*, 189
GUERRIER, P., P. L. KRUPA AND G. H. COUSINEAU. The effect of puromycin on *Chaetopterus* development, 388
See C. G. PILAPIL, 398
GWILLIAM, G. F. AND J. C. BRADBURY. Activity patterns in the isolated central nervous system of the barnacle and their relation to behavior, 502

H

HALLETT, M., I. TASAKI, A. SCHNEIDER AND E. CARBONE. Studies of the excitation process in nerve with extrinsic fluorescence, 388
HALVERSON, R. C. See R. K. JOSEPHSON, 411
HASCHEMEYER, A. E. V. AND R. PERSELL. Amino acid transport and plasma protein synthesis in toadfish liver *in vivo*, 389
HASELKORN, R. See R. K. CLAYTON, 381
HASTINGS, J. W. AND G. MITCHELL. Endosymbiotic bioluminescent bacteria from the light organ of pony fish, 261
See R. SCHMITTER, 401
HAYES, R. L. The effect of copper upon collagen fibrillogenesis in *Fundulus heteroclitus*, 389
Heart, neurogenic, of *Limulus*, induced myogenic activity in, 269
slug, pharmacology and reflect responsiveness of, 396
Heart of *Ecteinascidia turbinata*, 130
HEIDGER, P. M., JR., R. G. SUMMERS AND J. A. MILLER, JR. The effect of hyperbaric oxygen upon the embryonic development of *Arbacia punctulata*, 390
Helical substructure of microtubules, 592
Hemichordata, distribution of phosphagens in, 167
Hemoglobins, maturing duck, iso-electric gel focusing of, 372
HENDERSON, L. J., 376
HENDLER, G. AND D. R. FRANZ. Population dynamics and life history of *Crepidula convexa* Say, 514
HENLEY, C. See M. B. THOMAS, 592
Heterotrophic nutition of reef corals, 247
HILDEN, S. A. See R. S. BEAUCHAMP, 377
Hinge ligaments, relationship to adductor muscles in bivalve mollusks, 392
HINSCH, G. W. AND M. H. WALKER. Spermatophore formation in the vas deferens of the spider crabs, 373
See B. H. BERGSTROM, 378 AND M. H. WALKER, 375
Histological study of accessory pigment spot of *Palaemonetes vulgaris*, 391
History of biology, 1900–1930, 376
Hodgkin-Huxley theory, 387
Homarus americanus, membrane current in repetitive-firing axons, 383
Homing behavior in *Siphonaria alternata*, 449
Horizontal cells of skate retina, pharmacology of, 381
Host recognition in a symbiotic polychaete, induction of, 472
HUBBARD, R. See L. SPERLING, 402
HUMMON, W. D. Biogeography of sand beach Gastrotricha from the Northeastern United States, 390
Hybridization analysis of DNA replication in Cecropia moth, 384
Hydra, ionic requirements of transepithelial potentials in, 299
Hydra, pseudocolonial growth in, 278
Hydra viridis, pseudocolonial growth in, 278
Hydrostatic pressure in Ascidian metamorphosis, 382
Hyperbaric oxygen, effect on embryonic development of *Arbacia punctulata*, 390

I

Immunological studies on sponge aggregation, 393
Induction of host recognition in a symbiotic polychaete, 472
INOUE, S., G. H. COUSINEAU AND P. L. KRUPA. Jelly coat material of *Arbacia* eggs: and electron diffraction study, 391
See C. G. PILAPIL, 398
Insect blood, in tissue development, 527, 541
Insect diapause, 527
Interaction, capacitation-like, in *Campanularia flexuosa*, 398
Invertebrates, deep sea, relationship of genetic homozygosity to environmental stability in, 401
marine, accumulation of prostaglandins by tissues of, 372
marine, distribution of phosphoarginine and phosphocreatine in, 167
Ion distribution in *Latimeria*, 553
Ionic permeability during early development of a starfish, changes in, 404
Ionic requirements of transepithelial potentials in *Hydra*, 299
Iso-antigen for fertility control, 373
Isolation, aspartate, of receptor potentials in skate retina, 384
selective, of salt marsh algae, bacteria, protozoa and micrometazoan herbivores, 394

Isotrophy in squid giant axon, 378
ITAYA, S. K. AND J. C. CORNELL. A histological study of the accessory pigment spot of *Palaemonetes vulgaris*, 391

J

Jelly coat of *Arbacia* eggs, electron diffraction study of, 391
JOHANNES, R. E. See K. L. WEBB, 364
JOHNSON, S. AND S. ZIGMAN. Inhibition of dogfish retina protein synthesis by near UV light, 391
JOHNSON, W. E. See R. K. SELANDER, 402
JONES, J. C. On the heart of the orange tunicate, *Ecteinascidia turbinata* Herdman, 130
JONES, P. C. T. The effects of light and temperature on ATP level as a means of determining aggregation in the cellular slime molds, 146
JOSEPH, M. M. See A. H. MEIER, 331
JOSEPHSON, R. K. AND K. W. FLESSA. Cryolite: a new technique for observing burrowing in aquatic animals, 392
AND R. C. HALVERSON. High frequency muscles used in sound production by a katydid. I. Organization of the motor system, 411
See M. MACKLIN, 299
Junctions mediating coupling between cells, properties of, 378

K

KAHLER, G. A, JR. AND F. M. FISHER, JR. The relationship of hinge ligaments and adductor muscles in various bivalve mollusks, 392
KAMBYSELLIS, M. P. AND C. M. WILLIAMS. *In vitro* development of insect tissue. I. A macromolecular factor prerequisite for silkworm spermatogenesis, 527
In vitro development of insect tissues. II. The role of ecdysone in the spermatogenesis of silkworms, 541
Katydid, high frequency muscles used in sound production by, 411, 434
KENNEDY, E. See J. J. LEE, 394
KITZ, R. J. See J. T. ROBERTS, 399
KROPP, D. L. See R. S. BEAUCHAMP, 377
KRUPA, P. L., B. J. BOGITSH AND G. H. COUSINEAU. Ultrastructural demonstration of cytochrome oxidase activity in mitochondria of digenetic trematode larvae, 393
See P. GUERRIER, 388, S. INOUE, 391 AND C. G. PILAPIL, 398
KUHNS, W. J. AND M. M. BURGER. Sponge aggregation II: Immunologic studies on cell-cell interaction sites, 393
KUSANO, K. See D. R. LIVENGOOD, 396

L

LAMARCA, M. J., E. L. SHIPPEE AND A. W. SCHUETZ. RNA synthesis during oocyte maturation in *Asterias forbesi*, 394
LANG, F. Induced myogenic activity in the neurogenic heart of *Limulus polyphemus*, 269
Larvae, long-distance, development of, 99
Larval development of *Pagurus longicarpus*, 162
Petrolisthes tridentatus, 485
LASH, J. See R. A. CLONEY, 382
Latimeria chalumnae, osmotic constituents of 553
LEE, J. J., J. H. TIETJEN AND E. KENNEDY. Media for the enumeration and selective isolation of salt marsh epiphytic algae, bacteria, protozoa and micrometazoan herbivores from the community, 394
LEGNAME, A. H., S. N. FERNANDEZ AND D. C. MICELI. Respiratory regulation in *Bufo arenarum* eggs, 154
LEMON, S. M. See M. M. BURGER, 380
LESH-LAURIE, G. E. Observations on pseudocolonial growth in hydra, 278
LEVY, M. See A. GROSSMAN, 387 AND G. WEISSMANN, 407
Libinia, spermatophore formation in vas deferens of, 373
Libinia dubia, microsporidia in reproductive tract of, 375
Libinia emarginata, DNA analysis in, 405
Life history and population dynamics of *Crepidula convexa*, 514
Light, effect on ATP level in determining aggregation in cellular slime molds, 146
Light organ of pony fish, bioluminescent bacteria from, 261
Limax maximus, pharmacology and reflex responsiveness of heart of, 396
Limpet, homing behavior in, 449
Limulus, neuromuscular basis of coxal feeding movements in, 408
sodium dependence of reversal potential of light-induced current in, 379
photoreceptors, intracellular injection of Ca^{++}-EGTA solutions into, 395
Limulus polyphemus, induced myogenic activity in the neurogenic heart of, 269
LISMAN, J. E. AND J. E. BROWN. Intracellular injection of Ca^{++}-EGTA solutions in *Limulus* ventral photoreceptors, 395

LIUZZI, A. AND D. A. SNYDER. Some effects of colchicine on regeneration in *Tubularia*, 395
LIVENGOOD, D. R., T. L. PENCEK AND K. KUSANO. Modulation of the burst discharge rate of the lobster cardiac ganglion by an electrogenic Na^+ pump, 396
Lobster cardiac ganglion, modulation of burst discharge rate of, 396
Localization of light producing cells in *Mnemiopsis*, 399
LOEB, JACQUES, 376
LOEWUS, F. See G. WAGNER, 405
Loligo pealei, age and growth of, 189
identification of retinochrome in, 402
temperature effects on the development rate of embryos of, 561
Loligo pealii, changes in fluorescence of axons of, 382
inter-receptor relations in retinas and optic lobes of, 382
LUTZ, P. L. AND J. D. ROBERTSON. Osmotic constituents of the coelacanth *Latimeria chalumnae* Smith, 553

M

MACKAY, A. R. AND A. GELPERIN. Pharmacology and reflex responsiveness of the heart of the giant garden slug, *Limax maximus*, 396
MACKLIN, M. AND R. K. JOSEPHSON. The ionic requirements of transepithelial potentials in *Hydra*, 299
MACNICHOL, E. F., JR. See L. CERVETTO, 381
Macromolecular factor prerequisite for silkworm spermatogenesis, 527
Macrostomum, microtubules of spermatozoan in, 592
Magnesium, presynaptic action of, 403
Marine animals, use of Cryolite for observing burrowing in, 392
Marine Biological Laboratory, Annual Report, 1
MATSUMOTO, L. AND L. PIKO. *In vivo* radioactive labeling of mitochondrial DNA in *Arbacia punctulata* oocytes, 397
Maturation of *Arbacia punctulata* oocytes *in vitro*, 383
MAZAL, D. See A. FARMANFARMAIAN, 385
MCCLAY, D. R. An autoradiographic analysis of the species specificity during sponge cell reaggregation, 319
MCMAHON, J. J. AND W. C. SUMMERS. Temperature effects on the development rate of squid (*Loligo pealei*) embryos, 561
Mediaster aequalis, development, substratum selection, delay of metamorphosis and growth in, 99
Megalopa, ecology of in *Pagurus*, 162
MEIER, A. H., L. E. GARCIA AND M. M. JOSEPH. Corticosterone phases a circadian water-drive response to prolactin in the spotted newt, *Notopthalmus viridescens*, 331
Meiosis of surf clam eggs, changes in tubulin organization during, 406
Melanogrammus aeglefinus, swimbladder development and function in, 176
Membranes, photosynthetic, analysis of, 381
Metamorphosis and growth in *Mediaster aequalis*, delay of, 99
METZ, C. B., A. C. SEIGUER AND A. E. CASTRO. Mammalian sperm hyaluronidase, an isoantigen of possible interest for fertility control, 373
See N. R. ACKERMAN, 376 AND C. M. CONWAY, 383
MICELI, D. C. See S. N. FERNANDEZ, 154
Microciona prolifera, isolation of a surface component in aggregation of, 406
Micrometazoan herbivores, salt marsh, enumeration and selective isolation of, 394
Microsporidia in the spider crab reproductive tract, 375
Microtubules, spermatozoan, in flatworms, ultrastructure of, 592
MILCH, J. R. See G. FREEMAN, 386, G. T. REYNOLDS, 399 AND R. SCHMITTER, 401
MILKMAN, R. Genic polymorphism and population dynamics in *Mytilus edulis*, 397
MILLER, J. A., JR. See P. M. Heidger, JR., 390
MILLER, R. L. *Trichoplax adhaerens* Schulze, 1883. return of an enigma, 374
MINOR, R. R. See R. A. CLONEY, 382
MITCHELL, G. See J. W. HASTINGS, 261
Mnemiopsis, localization of light producing cells in, 399
role of embryogenesis in formation of light producing cells in, 386
Molgula manhattensis, cellular responses to foreign bodies in, 91
Mollusks, relationship to hinge ligaments and adductor muscles in, 392
MORGAN, T. H., 376
MOTE, M. I. See J. E. BROWN, 379
Motility control mechanisms in *Arbacia* sperm, 374
Motor system organization in the katydid, 411
Mucous trail in homing behavior of the limpet, 449
MUSCATINE, L. See V. B. PEARSE, 350
Muscle, *Limulus*, effects of ions on, 269
Muscle acetylcholinesterase in Ascidian eggs, development of, 407
Muscle development in *Artemia salina*, 386

Muscles, high frequency, used in sound production by a katydid, 411
Mustelus retina, spatial organization and adaptational changes of ganglion cells in, 403
Myogenic activity, induced, in the heart of *Limulus polyphemus*, 269
Mysid, bathypelagic, respiratory adaptations to oxygen minimum layer by, 109
Mytilus edulis, polymorphism and population dynamics in, 397
Mytilus shell, electron microscopy scanning of dissolution of, 380

N

Nelson, L. Motility control mechanisms in *Arbacia* sperm, 374
Nerve, excitation process in, 388
Nervous system, central, of barnacles, activity patterns in, 502
Neuroendocrine controls of reproduction in *Crepidula fornicata*, 400
Neurogenic heart of *Limulus*, 269
Neuromuscular basis of coxal feeding movements in *Limulus*, 408
Neurons, giant command, crayfish escape reflex circuit activated by, 408
Newt, spotted, circadian water-drive response to prolactin in, 331
Notopthalmus viridescens, circadian water-drive response to prolactin in, 331
Nutrition of sponges, 568
Nutritional role of hypertrophied siphonal epidermis in clams, 222

O

Oocyte maturation in *Asterias forbesi*, analysis of DNA synthesis during, 405
Oocyte maturation in *Asterias forbesi*, RNA synthesis during, 394
Olla, B. L and A. L. Studholme. The effest of temperature on the activity of bluefish, *Pomatomus saltatrix* L., 337
Opsanus tau, transport of sodium and sugar in the intestine of, 385
Optic lobes of squid, inter-receptor relations in, 382
O'Rand, M. G. *In vitro* fertilization and capacitation-like interaction in the hydroid *Campanularia flexuosa*, 398
Osmotic constituents of *Latimeria chalumnae*, 553
  regulation in *Hydra*, 299

P

Pagurus longicarpus, larval development of, 162
Palaemonetes vulgaris, histological study of accessory pigment spot of, 391
Particle feeding in natural populations of three marine demosponges, 568
Pearlman, A. L. and N. W. Daw. Light adaptation, dark adaptation, and pigment migration in the eye of the living squid, 398
Pearse, V. B. and L. Muscatine. Role of symbiotic algae (Zooxanthellae) in coral calcification, 350
Pencek, T. L. See D. R. Livengood, 396
Persell, R. See A. E. V. Haschemeyer, 389
Petrolisthes tridentatus, development of larvae in laboratory culture, 485
Phagocytosis of foreign bodies by a tunicate, 91
Phallodrilus parviatriatus, ecology, systematics and description of, 203
Pharmacology and reflex responsiveness of heart of *Limax maximus*, 396
Pharmacology of horizontal cells in skate retina, 381
Philosophy of science, 376
Phosphoarginine distribution in marine invertebrates, 167
Phosphocreatine distribution in marine invertebrates, 167
Photoreceptors, *Limulus*, intracellular injection of Ca^{++}EGTA solutions in, 395
Phyllochaetopterus prolifica, development of, 99
Phylogeny, biochemical, of invertebrates, 167
Phylogeny of the lower metazoa, 374
Physics, 1900–1930, 376
Phytoecdysones, role of in spermatogenesis of silkworms, 541
Pigment migration in the eye of the living squid, 398
  spot, accessory, of *Palaemonetes vulgaris*, histological study of, 391
Pikó, L. See L. Matsumoto, 397
Pilapil, C. G., P. L. Krupa, S. Inoue, E. C. Preddie, P. Guerrier and G. H. Cousineau, Protein initiation in developing sea urchin eggs: A preliminary report, 398
Planula of *Aurelia*, cellular differentiation in, 378
Podia of Echinoids, respiratory adaptations of, 385
Polychaete, symbiotic, behavioral specificity and induction of host recognition in, 472
Polymorphism, genic, in *Mytilus edulis*, 397
Pomatomus saltatrix, effect of temperature on activity of, 337
Pony fish, bioluminescent bacteria from the light organ of, 261

Population dynamics and life history of *Crepidula convexa*, 514
in *Mytilus edulis*, 397
of squid, 189
Population genetics, biochemical, of fiddler crabs, 402
Population study of *Loligo pealei*, 561
Populations, natural, of demosponges, particle feeding in, 568
Porcellanidae, discussion of larval characters in, 485
Porifera, feeding of, 568
Postfertilization dark recovery of UV-irradiated *Arbacia* sperm, 400
Potassium influxes in *Tetrahymena*, 377
Potentials, receptor, in the skate retina, isolation of, 384
PREDDIE, E. C. See C. G. PILAPIL, 398
Pressure-tension pulses in axons, 378
PRICE, C. A. See R. A. BOWEN, 379
Prolactin in the spotted newt, circadian water-drive response to, 331
Prostaglandins accumulation by tissues of marine invertebrates and vertebrates, 372
Protein synthesis in developing sea urchin eggs, 398
dogfish lens, inhibition of, 409
toadfish liver, 389
of dogfish retina, inhibition of, 391
Proteins, effects of near-UV tryptophan photoproducts on, 375
Prothoracic glands in silkworms, 527, 541
Protochordata, distribution of phosphagens in, 167
Protofibrils of microtubules, 592
Protozoa, salt marsh, enumeration and selective isolation of, 394
Pseudocolonial growth in hydra, 278
PTA negative staining of microtubules, 592
Pump, electrogenic Na^+, modulation of burst discharge rate of lobster cardiac ganglion by, 396
Puromycin, effect on *Chaetopterus* development of, 388

R

Radioactive labeling of DNA in *Arbacia punctulata* oocytes, 397
RADIUS, R. See M. M. BURGER, 380
Regeneration in *Tubularia*, effects of colchicine on, 395
REISWIG, H. M. Particle feeding in natural populations of three marine demosponges, 568
Release of free amino acids by starfish, 122
Reproductive function in gobiid fish, effects of food deprivation and salinity changes on, 458
Reproductive tract of *Libinia*, microsporidia in, 375
Respiratory adaptations of the podia of Echinoids, 385
Respiratory regulation in *Bufo arenarum* eggs, 154
Retina, skate, pharmacology of horizontal cells of, 381
squid, inter-receptor relations in, 382
Retinochrome in *Loligo pealei*, identification of, 402
REYNOLDS, G. T, G. FREEMAN AND J. R. MILCH. Localization of light producing cells in adult *Mnemiopsis*, 399
See G. FREEMAN, 386 AND R. SCHMITTER, 401
RIPPS, H. See J. E. DOWLING, 384
RNA synthesis during oocyte maturation in *Asterias forbesi*, 394
ROBERTS, J. T. AND R. J. KITZ. Circular dichroism and the revised structure of d-tubocurarine, 399
ROBERTS, M. H., JR. Larval development of *Pagurus longicarpus* Say reared in the laboratory. IV. Aspects of the ecology of the megalopa, 162
ROBERTSON, J. D. See P. L. LUTZ, 553
ROCKSTEIN, M. The distribution of phosphoarginine and phosphocreatine in marine invertebrates, 167
ROSS, A. See A. FARMANFARMAIAN, 385
RUSSELL-HUNTER, W. D., M. L. APLEY AND J. L. BANNER, III. Preliminary studies on brain implants and sex changes in *Crepidula fornicata* (L.) 400
RUSTAD, R. C. AND P. M. FAILLA. Postfertilization dark recovery of UV-irradiated *Arbacia* sperm, 400

S

Salinity and starvation, effect on release of dissolved free amino acids by *Dugesia dorotocephala* and *Bdelloura candida*, 364
Salinity changes and food deprivation, effects on reproductive function in an estuarine gobiid fish, 458
Samia cynthia, in vitro development of tissue in, 527, 541
SAUNDERS, J. W., JR. See J. T. TUPPER, 404
SCHIFF, J. A. See G. WAGNER, 405
Schistosoma mansoni, ultrastructural demonstration of cytochrome oxidase activity in, 393
Schizoporella errata, genetic variation in, 235
SCHMITTER, R., J. W. HASTINGS, G. T. REYNOLDS AND J. R. MILCH. Bioluminescence of scintillons deposited on electron micro-

scope grids viewed by image intensification, 401
SCHNEIDER, A. See M. HALLETT, 388
SCHOPF, T. J. M. AND J. L. GOOCH. A natural experiment using deep-sea invertebrates to test the hypothesis that genetic homozygosity is proportional to environmental stability, 401
See J. L. GOOCH, 235
SCHUETZ, A. W. See M. J. LAMARCA, 394
SCHWARZ, A. Swimbladder development and function in the haddock, *Melanogrammus aeglefinus* L., 176
Scintillons, bioluminescence of, 401
Sea urchin eggs, effects of multiple antibody layers on fertilizability of, 376
protein synthesis in, 398
Sea urchins, distribution of phosphagens in, 167
Seasonal fattening in a teleost, 458
Seastar, development, substratum selection, delay of metamorphosis and growth in, 99
SEIGUER, A. C. See C. B. METZ, 373
SELANDER, R. K., W. E. JOHNSON AND J. C. AVISE. Biochemical population genetics of fiddler crabs (*Uca*), 402
Senescence in zooxanthellae, 222
Sensory synapse, presynaptic actions of calcium and magnesium and postsynaptic actions of glutamate at, 403
Serum factors in *in vitro* development of insect tissues, 527, 541
Settling behavior of *Mediaster aequalis*, 99
Sex change in *Crepidula fornicata*, 400
Sheath of squid giant axon, mechanical properties of, 378
SHIPPEE, E. L. See M. J. LAMARCA, 394
Silkworm spermatogenesis, macromolecular factor prerequisite for, 527
Singing muscles of katydids, ultrastructure of, 434
Siphonaria alternata, homing behavior in, 449
Skate retina, aspartate isolation of receptor potentials in, 384
Slime molds, cellular, effect of light and temperature on ATP level in, 146
Slug heart, pharmacology and reflex responsiveness of, 396
SNYDER, D. A. See A. LIUZZI, 395
Sodium, and sugar transport in the toadfish, 385
influxes in *Tetrahymena*, 377
transport in *Hydra*, 299
Sodium-dependence of reversal potential of light induced current in *Limulus* photoreceptors, 379
Solaster dawsoni, development of, 99
SORENSON, A. L. An effect of acetylcholine on the central nervous system of the crab *Carcinus maenas*, 402
Sorting of planktonic organisms, aid of density gradient centrifugation in, 379
Sound production by a katydid, 411, 434
Spatial organization of ganglion cells in *Mustelus* retina, 403
Species specificity during sponge cell reaggregation, 319
SPERLING, L. AND R. HUBBARD. The identification of retinochrome in *Loligo pealei*, 402
Sperm hyaluronidase, mammalian, for possible fertility control, 373
Spermatogenesis, silkworm, macromolecular factor prerequisite for, 527
Spermatophore formation in spider crab vas deferens, 373
Spermatozoa, *Arbacia*, motility control mechanisms in, 374
Spermatozoan microtubules in flatworms, ultrastructure of, 592
SPIRA, M. E. See M. V. L. BENNETT, 378
Spisula solidissima, changes in tubulin organization during meiosis in eggs of, 406
Sponge aggregation, immunological studies of, 393
isolation of a surface component in, 406
involvement of carbohydrates in, 380
Sponge cell reaggregation, autoradiographic analysis of species specificity during, 319
Sponges, feeding of, 568
Spontaneous activity in barnacles, 502
Squid, inter-receptor relations in retinas and optic lobes of, 382
light adaptation, dark adaptation, and pigment migration in the eye of, 398
population study of, 189
embryos, temperature effects on the development rate of, 561
giant axon, mechanical properties of the sheath and axoplasm of, 378
ST. ONGE, J. M. See R. A. BOWEN, 379
Stability, environmental, relationship to genetic homozygosity in deep sea invertebrates, 401
Starfish, changes in ionic permeability during early development of, 404
distribution of phosphagens in, 167
uptake and release of free amino acids by, 122
Starvation and salinity, effect on release of dissolved free amino acids by *Dugesia dorotocephala* and *Bdelloura candida*, 364
STEINBACH, A. B. AND M. V. L. BENNETT. Presynaptic actions of Ca and Mg and postsynaptic actions of glutamate at a sensory synapse, 403

STELL, W. K., P. B. DETWILER, H. G. WAGNER AND M. L. WOLBARST. Spatial organization and adaptational changes of On-Off ganglion cells in *Mustelus* retina, 403
STRATHMANN, R. R. See C. BIRKELAND, 99
STUDHOLME, A. L. See B. L. OLLA, 337
Substratum selection of *Mediaster aequalis*, 99
Sugar and sodium transport in the toadfish, 385
Sulfate, incorporation into carrageenan of, 405
SUMMERS, R. G., L. H. COLWIN, A. L. COLWIN AND R. TURNER. Fine structure of the acrosomal region in spermatozoa of two echinoderms, *Ctenodiscus* (starfish) and *Thyone* (Holothurian), 404
See P. M. HEIDGER, JR., 390
SUMMERS, W. C. Age and growth of *Loligo pealei*, a population study of the common Atlantic Coast squid, 189
See J. J. MCMAHON, 561
Surface component, isolation of, in sponge aggregation, 406
Swimbladder development and function in *Melanogrammus aeglefinus*, 176
Symbiosis in coral calcification, 350
Systematics and ecology of *Phallodrilus parviatriatus*, 203

T

TASAKI, I. See M. HALLETT, 388
Teleost reproductive cycling, control of, 458
TELFER, W. See M. CRIPPA, 384
Temperature, effect on activity of bluefish, 337
Temperature, effect on ATP level in determining aggregation in cellular slime molds, 146
Temperature effects on the development rate of squid embryos, 561
Tetrahymena, sodium and potassium influxes in, 377
THOMAS, M. B. AND C. HENLEY. Substructure of the cortical singlet microtubules in spermatozoa of *Macrostomum* (Platyhelminthes, Turbellaria) as revealed by negative staining, 592
Thyone, fine structure of acrosomal region in spermatozoa of, 404
TIETJEN, J. H. See J. J. LEE, 394
Tissues, contractile, in Ascidian metamorphosis, 382
Toadfish liver, amino acid transport and protein synthesis in, 389
Tosylerginine methyl ester hydrolase activity, redistribution of following fertilization of *Arbacia* eggs, 387
Transepithelial potentials in *Hydra*, ionic requirements of, 299
Transport of sodium and sugar in the toadfish, 385
Trichoplax adhaerens, description of, 374
TROLL, W. See A. GROSSMANN, 387 AND G. WEISSMANN, 407
Trophic cycles within the reef biotope, 247
Tryptophan, near-UV, effects on proteins of, 375
photooxidized, inhibition of dogfish lens protein synthesis by, 409
TSANG, M. L-S. See G. WAGNER, 405
Tubificidae of Cape Cod Bay, ecology, systematics and description of, 203
Tubularia, effects of colchicine on regeneration in, 395
Tubulin organization during meiosis of surf clam eggs, 406
Tunicate, cellular responses to foreign bodies in, 91
defense mechanisms, 91
heart, 130
TUPPER, J. T. AND J. SAUNDERS, JR. Changes in ionic permeability during early development of the starfish, *Asterias forbesi*, 404
TURANSKY, D. See L. Z. BITO, 372
TURNER, R. See R. G. SUMMERS, 404

U

Uca, biochemical population genetics of, 402
Ultrastructural demonstration of cytochrome oxidase acitivity in mitochondria of trematode larvae, 393
Ultrastructure, spermatozoan microtubules, in flatworms, 592
of *Aurelia*, 378
of dissolution of shell of *Mytilus*, 380
of giant clams, 222
of katydid singing muscles, 434
of reef corals, 247
of squid retinas and optic lobes, 382
Uptake of free amino acids by starfish, 122
of nutrients in tridacnid clams, 222
Urosalpinx boring organ, dissolution of shell of *Mytilus* by, 380
UV, near, tryptophan photoproducts, effects on proteins, 375
UV light, near, inhibition of dogfish retina protein synthesis by, 391
UV radiation of *Arbacia* sperm, 400

V

VAN VORIS, A. See L. Z. BITO, 372
VAUGHN, J. C. Satellite DNA analysis in the spider crab *Libinia emarginata*, 405
Vertebrate lens, 375

Vertebrates, marine, accumulation of prostaglandins by tissues of, 372

W

Waggoner, A. S. See L. B. Cohen, 382
Wagner, G., M. L-S. Tsang, J. A. Schiff and F. Loewus. Studies on the incorporation of sulfate into carrageenan in *Chondrus*, 405
Wagner, H. G. See W. K. Stell, 403
Walker, M. H. and G. W. Hinsch. Microsporidia in the reproductive tract of *Libinia dubia*, 375
See G. W. Hinsch, 373
Wassarman, P. M. Analysis of DNA synthesis during oocyte maturation and early cleavage in *Asterias forbesii*, 405
Webb, K. L., R. E. Johannes and S. J. Coward. Effects of salinity and starvation on release of dissolved free amino acids by *Dugesia dorotocephala* and *Bdelloura candida* (Platyhelminthes, Turbellaria), 364
Weck, S. See A. Grossmann, 387 and G. Weissmann, 407
Weinbaum, G. and M. M. Burger. Sponge aggregation III: Isolation of a surface component required in addition to the aggregation factor, 406
Weisenberg, R. C. Changes in the organization of tubulin during meiosis in the eggs of the surf clam, *Spisula solidissima*, 406
Weissmann, G., S. Weck, L. P. Cagan, W. Troll, M. Levy and A. Grossman. Redistribution of beta-glucuronidase after fertilization of *Arbacia punctulata* eggs, 407
See A. Grossmann, 387
Whitehead, Alfred North, 376
Whittaker, J. R. Differentiation without cleavage in an Ascidian egg: development of muscle acetylcholinesterase, 407
Williams, C. M. See M. P. Kambysellis, 527, 541
Wine, J. J. Escape reflex circuit in crayfish: interganglionic interneurons activated by the giant command neurons, 408
Wolbarsht, M. L. See W. K. Stell, 403
Wyse, G. A. and N. K. Dwyer. The neuromuscular basis of coxal feeding movements in *Limulus*, 408

Y

Yonge, C. M. See T. F. Goreau, 247
Yulo, T. and S. Zigman. Inhibition of dogfish lens protein synthesis by near UV photooxidized tryptophan, 409

Z

Zigman, S. Effects of near-UV tryptophan photoproducts on proteins, 375
See S. Johnson, 391 and T. Yulo, 409
Zooplankton, use of density gradient centrifugation in sorting of, 379
Zooxanthellae, symbiontic, digestion of, by host amoebocytes in giant clams, 222